## King Saud University Collage of Computer and Information Science Computer Science Department

CSC 311 - Term 432

Quiz 1

Date: Tuesday February 8, 2022

**Duration:** 30 Minutes

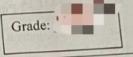
Student Name:

Student ID: 4



Section:





Question 1 / /2 Points

Use the formal definition of  $\theta$  to prove that  $2n^3 - 7n + 1 \in \theta(n^3)$ . Provide appropriate  $c_1, c_2$ , and  $n_0$  constants. Show Gn3 = 2n3 - 7 n+1 > C2n3 all steps required.

prove big-0:

$$2 - \frac{1}{n^2} + \frac{1}{n^3} \leqslant C \qquad ignor - term$$

$$= 2 + \frac{1}{n^3} \leqslant C \qquad in (\leqslant)$$

prove m: 3n3-7nx175n3 3- 72+ 737, C

$$C_1 = 3$$
,  $C_2 = 3 - \frac{7}{4} + \frac{1}{18}$ ,  $n_0 = 3$ 

Use limits of rational functions to prove that  $(n) = 7n^2 + 3n \log n + 5n + 100 \in \theta(n^2)$ . Show all steps required.

اكبرطد n2+3 nlog n+5n+100 = lim = 7 109 n

constant

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For each blank, indicate whether  $A_i$  is in O or/and  $\Omega$  of  $B_i$ . More than one space per row can be valid. No explanation is required.

requires			2(P)
Note: $\ln n = \log_e n$ .	The second section of	A = O(B)	$A = \Omega(B)$
A	В		uses /
	n <sup>2</sup>	No	105
$n^3$	5000n(n+1)	No	305
$0.0000001  n^3$	カシャル カルカ カルティア	yes V	SBX -01/
log <sup>7</sup> n	カチーライバ		yes,
	$\log n$	405	
ln n	$\left(\frac{13}{12}\right)^n$	No of	yes -0,26
$\left(\frac{12}{13}\right)^n$	1 (12)		
	log <sup>2</sup> n	yest-	oil yes
$\sqrt{n}$	4	105	INO
log(n!)	$\log(n^n)$	yes	
108(			